

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Box Patent Application
 Assistant Commissioner for Patents
 Washington, D.C. 20231

NEW APPLICATION TRANSMITTAL

Transmitted herewith for filing is the patent application of
 Inventor(s): Pekka LONKA, Mikael KONKANEN

WARNING: 37 C.F.R. § 1.41(a)(1) points out:

"(a) A patent is applied for in the name or names of the actual inventor or inventors.

"(1) The inventorship of a nonprovisional application is that inventorship set forth in the oath or declaration as prescribed by § 1.63, except as provided for in § 1.53(d)(4) and § 1.63(d). If an oath or declaration as prescribed by § 1.63 is not filed during the pendency of a nonprovisional application, the inventorship is that inventorship set forth in the application papers filed pursuant to § 1.53(b), unless a petition under this paragraph accompanied by the fee set forth in § 1.17(f) is filed supplying or changing the name or names of the inventor or inventors."

For (title):

TELESCOPIC TELEPHONE

CERTIFICATION UNDER 37 C.F.R. 1.10*

(Express Mail label number is mandatory.)

(Express Mail certification is optional.)

I hereby certify that this New Application Transmittal and the documents referred to as attached therein are being deposited with the United States Postal Service on this date March 12, 1999 in an envelope as "Express Mail Post Office to Addressee," mailing Label Number EL067098960US, addressed to the: Assistant Commissioner for Patents, Washington, D.C. 20231.

Debra G. Conrad

(type or print name of person mailing paper)

Debra G. Conrad

Signature of person mailing paper

WARNING: Certificate of mailing (first class) or facsimile transmission procedures of 37 C.F.R. 1.8 cannot be used to obtain a date of mailing or transmission for this correspondence.

***WARNING:** Each paper or fee filed by "Express Mail" must have the number of the "Express Mail" mailing label placed thereon prior to mailing. 37 C.F.R. 1.10(b).

"Since the filing of correspondence under § 1.10 without the Express Mail mailing label thereon is an oversight that can be avoided by the exercise of reasonable care, requests for waiver of this requirement will **not** be granted on petition." Notice of Oct. 24, 1996, 60 Fed. Reg. 56,439, at 56,442.

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jc511 U.S. PTO
 09/268080

03/12/99

jc490 U.S. PTO
 03/12/99

09268080 031299

1. Type of Application

This new application is for a(n)

(check one applicable item below)

- ☒ Original (nonprovisional)
☐ Design
☐ Plant

WARNING: Do not use this transmittal for a completion in the U.S. of an International Application under 35 U.S.C. 371(c)(4), unless the International Application is being filed as a divisional, continuation or continuation-in-part application.

WARNING: Do not use this transmittal for the filing of a provisional application.

NOTE: If one of the following 3 items apply, then complete and attach ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF A PRIOR U.S. APPLICATION CLAIMED and a NOTIFICATION IN PARENT APPLICATION OF THE FILING OF THIS CONTINUATION APPLICATION.

- ☐ Divisional.
☐ Continuation.
☐ Continuation-in-part (C-I-P).

2. Benefit of Prior U.S. Application(s) (35 U.S.C. 119(e), 120, or 121)

NOTE: A nonprovisional application may claim an invention disclosed in one or more prior filed copending nonprovisional applications or copending international applications designating the United States of America. In order for a nonprovisional application to claim the benefit of a prior filed copending nonprovisional application or copending international application designating the United States of America, each prior application must name as an inventor at least one inventor named in the later filed nonprovisional application and disclose the named inventor's invention claimed in at least one claim of the later filed nonprovisional application in the manner provided by the first paragraph of 35 U.S.C. 112. Each prior application must also be:

(i) An international application entitled to a filing date in accordance with PCT Article 11 and designating the United States of America; or

(ii) Complete as set forth in § 1.51(b); or

(iii) Entitled to a filing date as set forth in § 1.53(b) or § 1.53(d) and include the basic filing fee set forth in § 1.16; or

(iv) Entitled to a filing date as set forth in § 1.53(b) and have paid therein the processing and retention fee set forth in § 1.21(f) within the time period set forth in § 1.53(f).

37 C.F.R. § 1.78(a)(1).

NOTE: If the new application being transmitted is a divisional, continuation or a continuation-in-part of a parent case, or where the parent case is an International Application which designated the U.S., or benefit of a prior provisional application is claimed, then check the following item and complete and attach ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED.

WARNING: If an application claims the benefit of the filing date of an earlier filed application under 35 U.S.C. 120, 121 or 365(c), the 20-year term of that application will be based upon the filing date of the earliest U.S. application that the application makes reference to under 35 U.S.C. 120, 121 or 365(c). (35 U.S.C. 154(a)(2) does not take into account, for the determination of the patent term, any application on which priority is claimed under 35 U.S.C. 119, 365(a) or 365(b).) For a c-i-p application, applicant should review whether any claim in the patent that will issue is supported by an earlier application and, if not, the applicant should consider canceling the reference to the earlier filed application. The term of a patent is not based on a claim-by-claim approach. See Notice of April 14, 1995, 60 Fed. Reg. 20,195, at 20,205.

[illegible]

- ### 3. Papers Enclosed

6 Sheets of drawing

(complete the following, if applicable)

- ☐
- informal

 Other

☐ Citations

- ☐ Declaration of Biological Deposit
- ☐ Submission of "Sequence Listing," computer readable copy and/or amendment pertaining thereto for biotechnology invention containing nucleotide and/or amino acid sequence.
- ☐ Authorization of Attorney(s) to Accept and Follow Instructions from Representative
- ☐ Special Comments
- ☐ Other

5. Declaration or oath (including power of attorney)

NOTE: A newly executed declaration is not required in a continuation or divisional application provided that the prior nonprovisional application contained a declaration as required, the application being filed is by all or fewer than all the inventors named in the prior application, there is no new matter in the application being filed, and a copy of the executed declaration filed in the prior application (showing the signature or an indication thereon that it was signed) is submitted. The copy must be accompanied by a statement requesting deletion of the names of person(s) who are not inventors of the application being filed. If the declaration in the prior application was filed under § 1.47, then a copy of that declaration must be filed accompanied by a copy of the decision granting § 1.47 status or, if a nonsigning person under § 1.47 has subsequently joined in a prior application, then a copy of the subsequently executed declaration must be filed. See 37 C.F.R. §§ 1.63(d)(1)-(3).

NOTE: A declaration filed to complete an application must be executed, identify the specification to which it is directed, identify each inventor by full name including family name and at least one given name, without abbreviation together with any other given name or initial, and the residence, post office address and country or citizenship of each inventor, and state whether the inventor is a sole or joint inventor. 37 C.F.R. § 1.63(a)(1)-(4).

☒ Enclosed.

Executed by

(check all applicable boxes)

☒ inventor(s).

☐ legal representative of inventor(s).
37 CFR 1.42 or 1.43.

☐ joint inventor or person showing a proprietary interest on behalf of inventor who refused to sign or cannot be reached.

☐ This is the petition required by 37 CFR 1.47 and the statement required by 37 CFR 1.47 is also attached. See item 13 below for fee.

☐ Not Enclosed.

NOTE: Where the filing is a completion in the U.S. of an International Application or where the completion of the U.S. application contains subject matter in addition to the International Application, the application may be treated as a continuation or continuation-in-part, as the case may be, utilizing ADDED PAGE FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION CLAIMED.

☐ Application is made by a person authorized under 37 C.F.R. 1.41(c) on behalf of all the above named inventor(s).

(The declaration or oath, along with the surcharge required by 37 CFR 1.16(e) can be filed subsequently).

☐ Showing that the filing is authorized.
(not required unless called into question. 37 CFR 1.41(d))

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SECRET-0000000000

Table 1

The inventorship for all the claims in this application are:

- or

- (Application Transmittal [4-1]--page 5 of 11)

9. Certified Copy

Certified copy(ies) of application(s)

Country	Appln. No.	Filed
Finland	980602	18 March 1998
Country	Appln. No.	Filed
Country	Appln. No.	Filed

from which priority is claimed

☒ is (are) attached.

☐ will follow.

NOTE: The foreign application forming the basis for the claim for priority must be referred to in the oath or declaration. 37 CFR 1.55(a) and 1.63.

NOTE: This item is for any foreign priority for which the application being filed directly relates. If any parent U.S. application or International Application from which this application claims benefit under 35 U.S.C. 120 is itself entitled to priority from a prior foreign application, then complete item 18 on the ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED.

10. Fee Calculation (37 C.F.R. 1.16)

A. ☒ Regular application

CLAIMS AS FILED			
Number filed	Number Extra	Rate	Basic Fee 37 C.F.R. 1.16(a) \$760.00
Total			
Claims (37 CFR 1.16(c)) 17 - 20 =	0 X	\$ 18.00	
Independent			
Claims (37 CFR 1.16(b)) ¹ - 3 =	0 X	\$ 78.00	
Multiple dependent claim(s), if any (37 CFR 1.16(d))			
	+	\$ 260.00	

☐ Amendment cancelling extra claims is enclosed.

☐ Amendment deleting multiple-dependencies is enclosed.

☐ Fee for extra claims is not being paid at this time.

NOTE: If the fees for extra claims are not paid on filing they must be paid or the claims cancelled by amendment, prior to the expiration of the time period set for response by the Patent and Trademark Office in any notice of fee deficiency. 37 CFR 1.16(d).

Filing Fee Calculation

\$ 760.00

B. ☐ Design application
(\$ 310.00—37 CFR 1.16(f))

Filing Fee Calculation

\$ _____

C. ☐ Plant application
(\$ 480.00—37 CFR 1.16(g))

Filing fee calculation

\$ _____

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2025 RELEASE UNDER E.O. 14176

11. Small Entity Statement(s)

- ☐ Statement(s) that this is a filing by a small entity under 37 CFR 1.9 and 1.27 is (are) attached.

WARNING: "Status as a small entity must be specifically established in each application or patent in which the status is available and desired. Status as a small entity in one application or patent does not affect any other application or patent, including applications or patents which are directly or indirectly dependent upon the application or patent in which the status has been established. The refiling of an application under § 1.53 as a continuation, division, or continuation-in-part (including a continued prosecution application under § 1.53(d)), or the filing of a reissue application requires a new determination as to continued entitlement to small entity status for the continuing or reissue application. A nonprovisional application claiming benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) of a prior application, or a reissue application may rely on a statement filed in the prior application or in the patent if the nonprovisional application or the reissue application includes a reference to the statement in the prior application or in the patent or includes a copy of the statement in the prior application or in the patent and status as a small entity is still proper and desired. The payment of the small entity basic statutory filing fee will be treated as such a reference for purposes of this section." 37 C.F.R. § 1.23(a)(2).

(complete the following, if applicable)

- ☐ Status as a small entity was claimed in prior application
_____ / _____, filed on _____, from which benefit
is being claimed for this application under:

35 U.S.C. ☐ 119(e),
☐ 120,
☐ 121,
☐ 365(c),

- and which status as a small entity is still proper and desired.

- ☐ A copy of the statement in the prior application is included.

Filing Fee Calculation (50% of A, B or C above)

\$ _____

NOTE: Any excess of the full fee paid will be refunded if small entity status is established and a refund request are filed within 2 months of the date of timely payment of a full fee. The two-month period is not extendable under § 1.136, 37 CFR 1.28(a).

12. Request for International-Type Search (37 C.F.R. 1.104(d))

(complete, if applicable)

- ☐ Please prepare an international-type search report for this application at the time when national examination on the merits takes place.

(Application Transmittal [4-1]—page 7 of 11)

RECEIVED 03059200

13. Fee Payment Being Made at This Time

☐ Not Enclosed

☐ No filing fee is to be paid at this time.

(This and the surcharge required by 37 C.F.R. 1.16(e) can be paid subsequently.)

☒ Enclosed

☒ Filing fee

\$ 760.00

☒ Recording assignment

(\$40.00; 37 C.F.R. 1.21(h))

(See attached "COVER SHEET FOR ASSIGNMENT ACCOMPANYING NEW APPLICATION".)

\$ 40.00

☐ Petition fee for filing by other than all the inventors or person on behalf of the inventor where inventor refused to sign or cannot be reached

(\$130.00; 37 C.F.R. 1.47 and 1.17(i))

\$

☐ For processing an application with a specification in

a non-English language

(\$130.00; 37 C.F.R. 1.52(d) and 1.17(k))

\$

☐ Processing and retention fee

(\$130.00; 37 C.F.R. 1.53(d) and 1.21(l))

\$

☐ Fee for international-type search report

(\$40.00; 37 C.F.R. 1.21(e))

\$

NOTE: 37 CFR 1.21(f) establishes a fee for processing and retaining any application that is abandoned for failing to complete the application pursuant to 37 CFR 1.53(f) and this, as well as the changes to 37 CFR 1.53 and 1.78(a)(1), indicate that in order to obtain the benefit of a prior U.S. application, either the basic filing fee must be paid, or the processing and retention fee of § 1.21(f) must be paid, within 1 year from notification under § 53(f).

Total fees enclosed

\$ 800.00

14. Method of Payment of Fees

☒ Check in the amount of \$ 800.00

☐ Charge Account No. _____ in the amount of \$ _____

A duplicate of this transmittal is attached.

NOTE: Fees should be itemized in such a manner that it is clear for which purpose the fees are paid. 37 CFR 1.22(b).

(Application Transmittal [4-1]—page 8 of 11)

08095260

[illegible]

WARNING: Accurately count claims, especially multiple dependent claims, to avoid unexpected high charges, if extra claim charges are authorized.

☒ The Commissioner is hereby authorized to charge the following additional fees by this paper and during the entire pendency of this application to Account No. 16-1350.

☒ 37 C.F.R. 1.16(b), (c) and (d) (presentation of extra claims)

☒ 37 C.F.R. 1.16(e) (surcharge for filing the basic filing fee and/or declaration on a date later than the filing date of the application)

☐ 37 C.F.R. 1.17 (application processing fees)

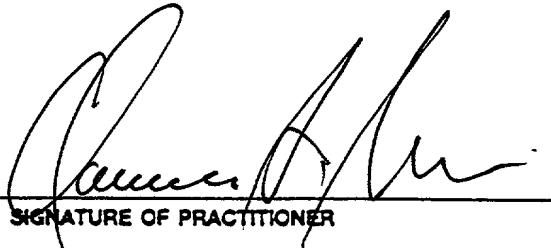
☐ 37 C.F.R. 1.18 (issue fee at or before mailing of Notice of Allowance, pursuant to 37 C.F.R. 1.311(b))

NOTE: 37 CFR 1.29(b) requires "Notification of any change in status resulting in loss of entitlement to small entity status must be filed in the application . . . prior to paying, or at the time of paying, . . . the issue fee. . . ." From the wording of 37 CFR 1.29(b), (a) notification of change of status must be made even if the fee is paid as "other than a small entity" and (b) no notification is required if the change is to another small entity.

16. Instructions as to Overpayment

NOTE: "... Amounts of twenty-five dollars or less will not be returned unless specifically requested within a reasonable time, nor will the payer be notified of such amounts; amounts over twenty-five dollars may be returned by check or, if requested, by credit to a deposit account." 37 C.F.R. § 1.26(a).

- ☒ Credit Account No. 16-1350
☐ Refund


SIGNATURE OF PRACTITIONER

Clarence A. Green

(type or print name of attorney)

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Customer No.

☐ **Incorporation by reference of added pages**

(check the following item if the application in this transmittal claims the benefit of prior U.S. application(s) (including an international application entering the U.S. stage as a continuation, divisional or C-I-P application) and complete and attach the ADDED PAGES FOR NEW APPLICATION TRANSMITTAL WHERE BENEFIT OF PRIOR U.S. APPLICATION(S) CLAIMED)

- ☐ Plus Added Pages for New Application Transmittal Where Benefit of Prior U.S. Application(s) Claimed

Number of pages added _____

- ☐ Plus Added Pages for Papers Referred to in Item 4 Above

Number of pages added _____

- ☐ Plus added pages deleting names of inventor(s) named in prior application(s) who is/are no longer inventor(s) of the subject matter claimed in this application.

Number of pages added _____

- ☐ Plus "Assignment Cover Letter Accompanying New Application"

Number of pages added _____

☒ **Statement Where No Further Pages Added**

(if no further pages form a part of this Transmittal, then end this Transmittal with this page and check the following item)

- ☒ This transmittal ends with this page.

TITLE: Telescopic telephone

TECHNOLOGICAL FIELD

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In general, the invention relates to the electric and mechanical structure of telephones. In particular, the invention relates to the structure of a telescopically expanding telephone and to the location of its elements. The term telephone here means any hand-held apparatus designed for radio communications and provided with a microphone and a loudspeaker. By way of example, we shall here discuss a mobile phone.

10

BACKGROUND OF THE INVENTION

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Mobile phones are attempted to be made as small as possible in order to make them easily transportable in pockets or handbags. This tendency is, however, controversial to the feasibility of the telephone, because the user interface, i.e. mainly the keyboard and the display, must be made so small that on the display screen, there is room for limited information only (or the information must be shown on the screen with unreasonably small characters), and the keys and the spaces between them are unreasonably small for the fingers of an adult user. As a solution, there are suggested various folding telephones.

20

25 Figures 1 - 4 illustrate various prior art solutions designed mainly in order to enlarge the user interface of a small-size telephone. The mobile phone 100 illustrated in figure 1 comprises a housing 101 and a turning arm 102 attached to the side of the housing by means of a rotating joint. The loudspeaker 103 is provided in the housing 101, and the microphone 104 is located at the end of the turning arm 102. In preparation for use, the turning arm 102 is turned to a position illustrated by a uniform line in the drawing, and during transport it is turned to a position at the side of the housing 101, illustrated by a dotted line. The mobile phone 200 illustrated in figure 2 comprises a housing 201 and a flap 202 attached by a hinge at the bottom edge of the housing. In the transport position, the flap 202 covers the keyboard 203, and in preparation for use, the flap 202 is turned to the position illustrated in figure 2, so that the microphone 204 provided at the outer end of said flap 202 comes near to the user's mouth in the regular usage position. The regular usage position means

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that the user holds the telephone in his hand, so that the loudspeaker 205 is pressed against his ear and the flap 202 points more or less towards his chin.

Figure 3 illustrates a mobile phone 300 provided with a sliding lid, said mobile
 5 phone 300 comprising a housing 301 and a lid 302 attached thereto by means of
 slide rails. In the transport position, the lid 302 completely covers the keyboard 303.
 The usage position can be chosen according to how large a part of the keys 303 the
 user needs. Figure 3 illustrates a usage position where the lid 302 is completely
 open. The microphone 304 is located in the bottom part of the lid 302, and the
 10 loudspeaker 305 is located in the top part of the housing 301. The curved shape of
 the telephone 300 helps to find a comfortable usage position where the microphone
 304 and the loudspeaker 305 are placed in a desired position with respect to the
 user's mouth and ear. The mobile phone illustrated in figure 3 can be called a
 telescopic telephone, because its length in the direction of a given (curved)
 15 dimension can be adjusted by sliding two mutually attached elements in relation to
 each other in the direction of said dimension.

In the applications illustrated in figures 1 - 3, the folding or sliding features of the
 telephone do not solve the problem connected to the size of the keyboard and
 20 display, but the emphasis has been to adjust the distance between the microphone
 and the loudspeaker.

Figure 4 illustrates another known telescopic telephone 400, which is introduced in
 the Finnish registered design application No. 285/97. The telephone comprises a
 25 housing 401 and an upper sliding part 402 including a loudspeaker 403, a display
 404 and a small part of the keys 405. The housing 401 includes the rest of the keys
 406, a microphone 407 and an antenna 408. For transporting the telephone, the
 upper sliding part 402 can be sled on top of the housing 401, so that the keyboard
 406 is covered. The functional practicality of this embodiment is dubious, because
 30 the antenna is easily left inside the user's hand, or very near to the user's hand, in
 which case it does not work in the best possible way. In order to realise a precise
 and versatile display in the embodiment of figure 4, there is needed a large amount
 of leads in between the housing and the upper sliding part, which is problematic
 with respect to the technical applications. Usually the display 404 is provided with a
 35 glass plate or other such easily breakable part that requires a solid supporting
 structure around it; this requirement is difficult to fulfil in the embodiment
 according to figure 4. Moreover, there are shortcomings in the user ergonomics.

Figures 5a and 5b illustrate a known method for realising a large-size user interface. A multiple-use mobile phone 500 comprises a top part 501 and a bottom part 502, which are interconnected with a hinge. The outer surface of the top part 501 constitutes a first user interface including a small-size display 503 and a number keyboard 504. The inner surfaces of the top part 501 and the bottom part 502 are shown by opening the telephone like a book, as is seen in figure 5b. The inner surfaces comprise another user interface provided with a large-size display and a letter keyboard 506. This application is not as such suited to the manufacturing of a mobile phone only, because in the position illustrated in figure 5b, the instrument 500 cannot be held on the side of the head like a telephone.

SUMMARY OF THE INVENTION

The object of the present invention is to introduce a telephone which is small in the transport position, but is still provided with a large-size user interface. Another object of the invention is that the telephone is, with respect to its mechanical structure, easy to use, durable and ergonomic. Yet another object of the invention is that in the regular usage position, the telephone antenna does not fall in the shadow of the user's hand.

The objects of the invention are achieved by locating, in the upper part of the telephone, an antenna and the radio frequency parts, among others, and in the lower part, the power source and the major part of the keys, among others. The lower part and the upper part are movably attached to each other, so that the telephone has a small-size transport position and a larger-size operating position.

The telephone according to the invention comprises a first part and a second part attached thereto, said second part being movable in relation to the first part between a first position and a second position. It is characterised in that it in the first part comprises a radio transmitter/receiver and a connected antenna, and in the second part an arrangement for fastening the battery to the second part.

The mobile phone according to the invention comprises two parts that are sliding in relation to each other, and these parts are in the present application called upper part and lower part. Said terms refer to the mutual location of the parts in the appended drawings, and they do not restrict the manufacture, treatment or usage of the mobile phone of the invention with respect to any particular direction. The upper part is

also called the first part of the telephone, and the lower part is respectively called the second part. The mutual movability of the upper and the lower part is realised in a sliding fashion, so that in the transport position, the upper and the lower part are located mainly in an overlapping fashion, and for operation they can be sled to a mutual position which is most comfortable for the user in each particular case.

According to a preferred embodiment, the upper part of the telephone according to the invention comprises at least an antenna, a radio transmitter/receiver, a loudspeaker, a microphone and a display as well as part of the keys and a scanner for a smart card. The lower part comprises an arrangement for fastening a battery or a corresponding power source for the telephone, as well as the major part of the keys. The lower part is designed so that during operations, it is most natural for the user to hold the lower part of the telephone in his hand. Thus the antenna provided in the upper part is not left in the shadow of the user's hand, and not even very near to said hand. The battery attached to the lower part is a fairly heavy component, which improves the ergonomics of the telephone according to the invention in comparison with for example the telephone according to figure 3, where the lower part is very light. By installing the telephone components in the upper and the lower parts in an advantageous fashion, to be explained in more detail below, the number of electric contacts in between said parts is kept small, which is advantageous for usage security. In particular, the invention enables the use of a relatively large display and keyboard even in a small mobile phone.

An additional feature according to the invention is the lock and release mechanism based on spring power that is provided between the upper and the lower part, whereby the telephone can be adjusted from the transport position to the operating position by using one hand only. This is particularly advantageous because when a call comes in, the user must react fairly rapidly in order to answer the call, and he cannot always use both hands to do this. Other advantageous additional features are attenuation connected to the opening mechanism, and the realisation of the lower part keyboard as a module — provided, in addition to the keys, also with electric connections to the upper part, to the battery, to the charging device and to other possible electric components of the lower part.

BRIEF DESCRIPTION OF THE DRAWINGS

The invention is explained in more detail below, with reference to the preferred embodiments presented by way of example and to the appended drawings, where

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figure 1 illustrates a prior art mobile phone,

figure 2 illustrates another prior art mobile phone,

figure 3 illustrates a third prior art mobile phone,

figure 4 illustrates a fourth prior art mobile phone,

10 figure 5a illustrates a prior art mobile station,

figure 5b illustrates the mobile station of figure 5a in another position,

figure 6a illustrates a telephone of the invention in the operating position,

figure 6b illustrates the telephone of figure 6a in the transport position,

figure 7a illustrates a method for realising the motion between the upper and
15 the lower part,

figure 7b illustrates a method for attenuating the motion between the upper
and the lower part, and

figure 8 illustrates a keyboard module in a telephone according to the invention.

20 In the above description of the prior art we already referred to figures 1 - 5, and in the specification of the invention and the preferred embodiments below, we shall mainly refer to figures 6a - 8. Like numbers for like parts are used in the drawings.

25 DETAILED DESCRIPTION OF THE INVENTION

Figure 6a is a schematical illustration of a mobile phone 600, including an upper part 601 and a lower part 602. In the upper part 601, inside the shell, there is provided an antenna 603 for transmitting and receiving radio frequency messages,
30 as well as a radio transmitter/receiver 604. In addition, the upper part 601 includes a loudspeaker 605, a microphone 611, a display 606, a smart card scanner 607 and a quick-action keyboard 608 including a few keys, advantageously provided with at least three and no more than ten keys; however, these numbers are not restrictive from the point of view of the invention. Typical keys of the quick-action keyboard
35 608 are the keys for starting and finishing a call, arrow keys or corresponding browsing keys and memory management keys. The quick-action keyboard 608 may also include a known multi-usage key, such as a Navi™ key. In figure 6a, dotted

lines are used to illustrate the contours of such parts that are not visible in the drawing, because they are located inside the telephone.

The lower part 602 of the mobile phone illustrated in figure 6a comprises at least a number keyboard 609 and a battery 610. Moreover, at the edge of the lower part 602, there is connected a charging device 612. Advantageously the number keyboard 609 includes at least the number keys from zero to nine. In addition, there may be included keys for controlling such operations that in a typical mobile phone usage are needed less frequently than the operations controlled by the keys of the quick-action keyboard 608, or which, for one reason or another, can only be used when the mobile phone is in the operating position. The sides of the lower part 602 of the mobile phone are designed so that a typical user gets a good grip thereof. In particular this means that the lower part is solid enough. In order to help the user in getting a good grip and in order to appropriately focus the pressure caused by the grip, the lower part may also be provided with particular grip designs 613, said designs being projections, recesses and/or non-slip features.

Figure 6b illustrates the mobile phone of figure 6a in the transport position. The upper part 601 and the lower part 602 are sled, in relation to each other, so that they are located in an essentially overlapping fashion. The means for facilitating said sliding and locking in the position illustrated in figure 6b shall be described in more detail below. In the transport position, the keyboard remains in between the upper and the lower part and is not available for the user. On the other hand, the microphone 611 is not covered in the transport position, and thus the mobile phone 600 can be used as a telephone also in the position illustrated in figure 6b. Here the terms operating position and transport position must be understood as names of the positions illustrated in figures 6a and 6b only — they do not in any way restrict the usage or transportation of the mobile phone 600. A minimum requirement is that even in the transport position, the mobile phone must be able to exchange signalling messages connected to the idle mode of a normal cellular radio system terminal with a given base station.

The microphone 611 could also be installed in the lower part, in which case it would in the operating position be located nearer to the user's mouth than in the structure illustrated in figures 6a and 6b. However, it would then be necessary to provide one lead connection more in between the upper and the lower part, in order to lead the signal from the microphone to the radio transmitter/receiver provided in the upper part. On the basis of figure 6a, it is easily seen how the lower part 602

functions as the voice conductor, conducting the user's speech to the microphone, when the user holds the telephone illustrated in the drawing in the operating position, at the side of his head. Simultaneously the lower part prevents interfering noise from elsewhere from directly entering the microphone. The essential point in the location of the microphone is that it should not in any normal, anticipated usage situation be pressed against the user's cheek, so that the voice could not reach the microphone.

The use of a mobile phone according to the invention can be further facilitated by providing it with a function according to which an incoming call can be answered simply by opening the telephone from the transport position to the operating position. The technical application for implementing this function could in principle be similar to the one provided in the known Nokia 8110 mobile phone manufactured by Nokia Mobile Phones; in structure this application corresponds to the one illustrated in figure 3, where it is sufficient to open the sliding lid in order to answer an incoming call.

Figure 7a is a schematical illustration of a preferred embodiment as regards the means for realising the mutual slide function between the upper and the lower part. The lower part is provided with slide rails 701, and the upper part is provided with matching counter-rails 702. In addition, the lower part is provided with a string 703 surrounded by a support tube 704. The upper part is provided with a piston 705, and the piston is designed and placed so that when the telephone according to the invention is sled to the transport position, the piston 705 is pressed to inside the support tube 704, and it presses the spring 703 together in the direction of the longitudinal axis thereof. The lower part includes a trigger 706 provided with a detent pin 707 that is matched to fit in the recess 708, provided in the upper part, when the mobile phone is in the transport position. The detent pin 707 and the recess 708 together constitute a locking design, the purpose of which is to keep the mobile phone in the transport position, although the strength of the compressed string 703 tries to push the piston 705 and thereby the whole upper part towards the operating position. When the trigger 706 is now suitably moved, the detent pin 707 slides out of the recess 708, so that the string 703 pushes the mobile phone, by intermediation of the piston 705, to the operating position. The trigger 706 is advantageously arranged in connection with a grip design that is also otherwise natural for the user to hold. Such a grip design is for instance the bulge 613 illustrated in figure 6a.

In the slide rails 701, and/or in the counter-rails 702, or in some other place in the mechanical structure of the apparatus, there are easily arranged stoppers which stop the mutual motion between the upper and the lower part before the string 703 has fully returned. Now in the operating position, the remaining compression of the spring 703 causes a strength in between the upper and the lower part, and this strength tries to maintain said parts in the operating position. There can also be presented an embodiment where a lock design connected to the trigger 706 or to another particularly designed trigger — or another known quick-release lock arrangement — locks the upper and the lower part in the operating position.

Advantageously the material of the parts illustrated in figure 7a is mainly polyethene or polypropylene plastic or some other generally known polymer, and the parts can be formed by injection moulding or by another known method. As regards the slide rails 701 and the counter-rails 702, at least one of these two are, however, advantageously made of metal or then they are metal-coated, because a drawback with plastic-plastic type slide parts is their high starting friction and the squeaking noise heard during the sliding. Longitudinal metal rails either in the upper or lower part also strengthen the mechanical structure of the telephone.

If the string 703, as the only factor affecting the motional speed, can freely adjust the opening of the mobile phone according to the invention from the transport position to the operating position, the opening motion easily becomes too sudden and vigorous. From the point of view of usage comfort, it is advantageous to use an attenuator for softening the opening motion. The invention does not restrict the type of the attenuator employed. Figure 7b illustrates, by way of example, an attenuator composed of a gear wheel 709 rotatably attached to the upper part and of a housing 710 surrounding the axis of said gear wheel, as well as of a gear rack 711 attached to the lower part. These are mutually arranged so that always when the upper and the lower part move in relation to each other, the gear rack 711 rotates the gear wheel 709 and the axis connected thereto and surrounded by the housing 710. In order to attenuate the motion, the housing 710 contains silicone oil, and the inertia caused by the moving of the oil tends to attenuate the rotating motion of the gear wheel 709. This attenuation is transmitted, via the gear wheel 709 and the gear rack 711, to the upper and the lower part, so that it softens the whole opening motion.

Figure 8 is an exploded illustration of a keyboard module 800 according to a preferred embodiment of the invention; this module enables the realisation of the lower part of the above described mobile phone in a simple fashion which also is

economical for the manufacturing technique. The electric core of the keyboard module is the circuit board 801, provided with contact pads for all elements to be electrically connected thereto, connector strips for the keys, known as such, and the required strip connectors for connecting the keys. If necessary, the circuit board 801 can be a multilayer circuit board. Among the elements to be electrically connected thereto, there are at least a slide connector 802 and a charging connector 803, as well as in a preferred embodiment of the invention, also a vibrating alarm 804 and an EL control 805 for controlling the electroluminescence illumination of the keyboard. The electrically connected elements are most advantageously fixed by soldering to the respective contact pads reserved for them; for the sake of graphical clarity, these pads are not illustrated in the drawing. The number keyboard is composed by connecting, in a known fashion, a film 806 including the contact pads on top of the connector strips provided in the circuit board 801 and by placing thereon an EL layer 807 which produces the electroluminescence display and a keypad 808 made of silicone or some other elastic material. The module composed of the above enlisted parts is attached to the shell element 809 by means of snap joints and/or screws. In the created module, there can be connected a battery 810 by means of a prior art quick-release locking mechanism.

The invention does not require that the illuminated patterns of the keyboard are realised by using electroluminescence. An alternative is a prior art LED illumination, where the above mentioned EL control and EL film are replaced by a known LED control and LED illumination means.

As a counterpart for the slide connector 802, the upper part of the telephone (not illustrated in the drawing) is provided with a number of lead tracks on the surface that is placed against the lower part of the telephone. The mutual design and location of the slide connector 802 and the lead tracks is chosen so that irrespective of the fact whether the telephone is in the transport position or in the operating position or somewhere in between, each switch spring 811 of the upper surface of the slide connector touches its own lead track. In other words, when sliding the upper and the lower parts of the telephone in relation to each other, each switch spring 811 of the upper surface of the slide connector slides, along its own lead track, in the lengthwise direction of said lead track. The slide connector 802 and the above mentioned lead tracks form an electric contact in between the upper and the lower parts of the telephone. The switch springs 811 of the slide connector are advantageously made elastic, in which case the location of the slide connector is chosen so that in a closed telephone, the switch springs 811 are continuously

subjected to a slight compressing force. The counteractive force caused by this elasticity then holds each switch spring compactly pressed against the respective lead track.

- 5 In figure 8, 12 switch springs are illustrated on the top surface of the slide connector 802. The invention does not restrict the number of the switch springs nor the method by which they are used for transmitting various signals between the upper and the lower part of the telephone. In order to improve operational security, it is advisable to use a minimum of two separate switch springs for transmitting at least
- 10 the service voltage and ground potential. According to a preferred embodiment, the use of the switch springs conforms to the following table:

Switch spring n:o	Target of use
1	keyboard
2	keyboard ground
3	keyboard
4	Bsi (Battery size indicator)
5	ground
6	ground
7	BTmp (Battery Temperature)
8	keyboard lights
9	positive battery voltage
10	positive battery voltage
11	vibrating alarm
12	charging voltage

- 15 The switch springs 812 provided at the side of the slide connector 802 are meant for forming a connection to the battery 810. Most advantageously the fastening of the battery is such that when fastened, it is pressed lightly against the switch springs 812, in which case the spring power improves the connection between the contact electrodes and the switch springs 812. The invention does not restrict the number or target of use of the switch springs provided at the side of the slide connector 812.

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The keyboard module is easy to manufacture owing to its compact structure. Moreover, the keyboard is easily detached and reattached in case it is somehow damaged or it should be replaced for some other reason. The achieved structure becomes fairly thin, which is advantageous with respect to the overall measures of

the telephone. In a structure according to a preferred embodiment, the battery 810 is narrower than the lower part of the telephone (cf. the battery illustrated by dotted lines in figure 6a), so that in the structure according to figure 8, on the other side of the battery there can be installed a charging connector 803, a vibrating alarm 804 and an EL control 805, and on the other side the protecting tube 704 illustrated in figure 7a and a string 703 provided therein.

Obviously the above described embodiments are presented by way of example only, and they do not restrict the invention. For example, most of the mechanical parts illustrated in figures 7a and 7b can be moved from one part of the telephone to another, the gear rack 711 may be installed in the upper part of the telephone and the gear wheel 709 and the housing 710 in the lower part thereof, and so forth. An exception is the trigger 706, which is preferably always placed in the lower part, because the idea is that during regular use, the user always holds the telephone in his hand by gripping the lower part. The microphone does not necessarily have to be a fixed installation, but it may be connected to the upper or the lower part for instance by intermediation of a similar turning arm as in the prior art telephone illustrated in figure 1. If there is desired a display where the horizontal dimension is larger than the vertical dimension, the display can be located lengthwise in the upper part, i.e. so that the direction of the horizontal dimension of the display is the same as the sliding direction of the above described upper part with respect to the lower part. In that case it may prove to be advantageous also to place the symbols connected to the keys so that they are easily figured out by the user when he holds the telephone "horizontally" in front of his eyes. The electric circuit controlling the display can also be arranged to function so that the user may choose whether he wants to use the display in the horizontal or in the vertical mode.

The invention does not require that the motion between the upper and the lower part takes place by sliding, but it is possible to realise an embodiment where the upper and the lower part are interconnected by a hinge, in similar fashion as the housing and flap in the prior art telephone illustrated in figure 2. However, the sliding motion is considered preferable, because it is easier to control with one hand only. In the above specification we have suggested the use of a spiral string as the only elastic means that produces strength in between the upper and the lower part. It is, however, obvious that any equivalent for a string can be used for the same purpose. Instead of the above described compression spring, the spiral spring can be a draw-string, so that in the transport position of the telephone, the draw-string is pulled tighter than in the operating position.

CLAIMS

1. A telephone comprising
 - a first part,
 - 5 - a second part attached to the first part movably between a first position and a second position,
 - in the first part a radio transceiver and an antenna coupled thereto, and
 - in the second part an arrangement for attaching a battery to the second part.
- 10 2. A telephone according to claim 1, additionally comprising in the first part a display and a quick-action keyboard, and in the second part a number keyboard.
3. A telephone according to claim 1, additionally comprising in the second part a module which comprises
 - 15 - a circuit board of the number keyboard,
 - a charging connector to form a connection to an external charging device arranged to charge a battery attached to the second part, and
 - a connector to form an electric connection between the first and the second part.
- 20 4. A telephone according to claim 3, wherein said connector for forming the electric connection between the first and the second part is simultaneously a connector for creating an electric connection between the second part and a battery attached thereto.
- 25 5. A telephone according to claim 3, additionally comprising in said module a vibrating alarm device attached to the circuit board of the number keyboard.
6. A telephone according to claim 1, wherein the second part is slidably movable in relation to the first part in between the first and the second position, for which
 - 30 function the second part comprises slide rails and the first part comprises matching counter-rails.
7. A telephone according to claim 6, wherein said first part and second part are in the first position located essentially on top of each other.
- 35 8. A telephone according to claim 6, additionally comprising an elastic member for creating a spring force in between the first and the second part.

9. A telephone according to claim 8, wherein said elastic member is a spring having an excited position and a released position, so that the first position of the second part corresponds to the excited position of the spring, and the second position of the second part corresponds to the released position of the spring.

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10. A telephone according to claim 9, additionally comprising a trigger mechanism in order to lock the second part in the position where said spring is excited, and to release the locked second part by means of user action.

10 11. A telephone according to claim 10, additionally comprising a mechanical attenuator for attenuating the mutual motion between the first and the second part while the second part moves in relation to the first part under the influence of the force created by said spring.

15 12. A telephone according to claim 11, wherein said attenuator comprises a gear wheel and a gear rack arranged in functional interaction with it, said gear wheel and gear rack being located one in the first part of the telephone and the other in the second part thereof, as well as an attenuating member for attenuating the rotating motion of said gear wheel.

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13. A telephone according to claim 1, wherein the second part is rotatably movable with respect to the first part in between the first and the second position, for which function the telephone is provided with a hinge in between the first and the second part.

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14. A telephone according to claim 1, additionally comprising in the second part a grip design for allowing a user to get a grip of the second part with one hand.

15. A telephone according to claim 1, additionally comprising a protecting shell of the first part, wherein said antenna is a plane antenna located inside said protecting shell of the first part.

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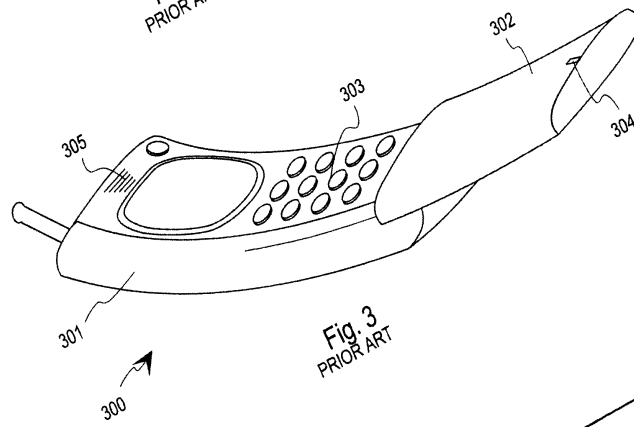
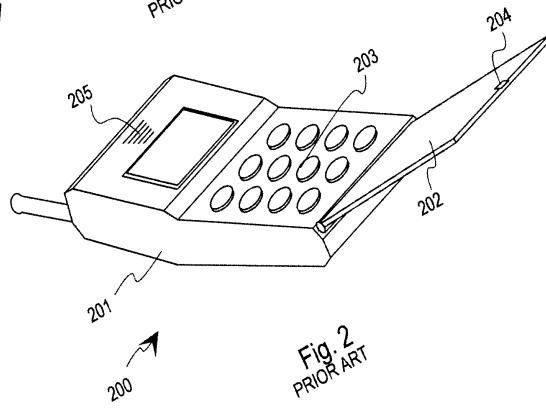
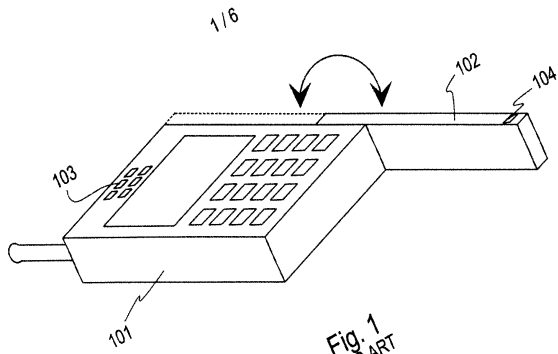
16. A telephone according to claim 1, additionally comprising means for receiving an incoming call by adjusting said first part from the first position to the second position.

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17. A telephone according to claim 1, characterised in that it is a mobile phone of a digital cellular network.

ABSTRACT

A telephone comprises a first part (601) and a second part (602) attached thereto, said second part being movable in relation to the first part between a first position and a second position. The telephone further comprises in the first part a radio transmitter/receiver (604) and a connected antenna (603), and in the second part an arrangement for attaching the battery (610) to the second part.



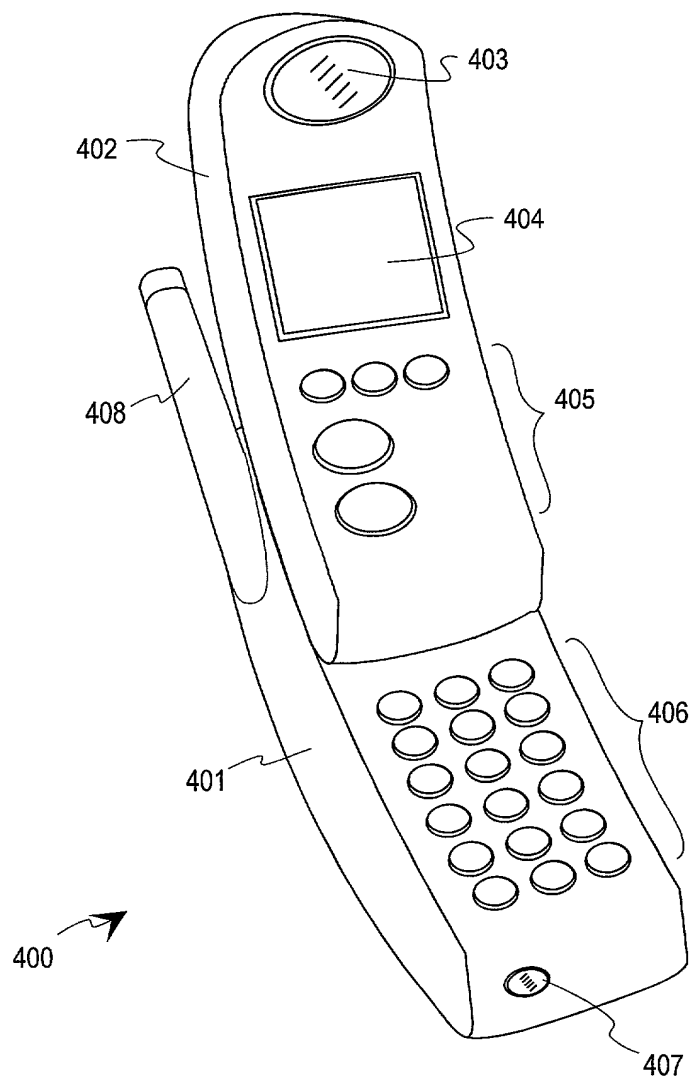
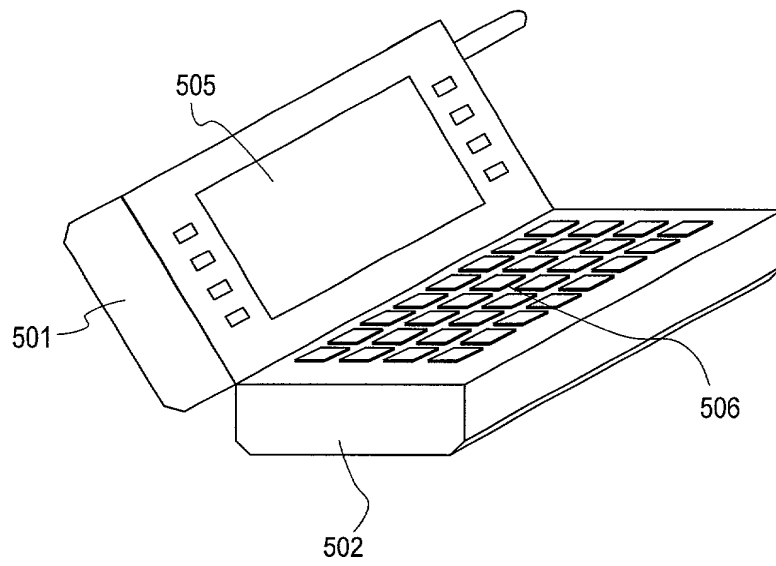
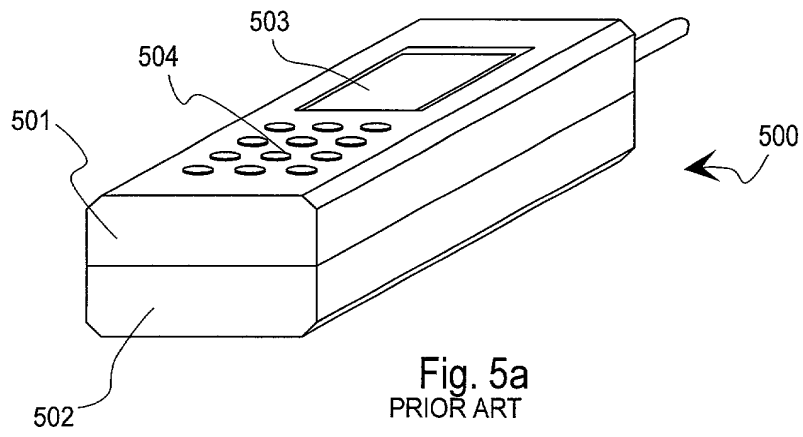


Fig. 4
PRIOR ART



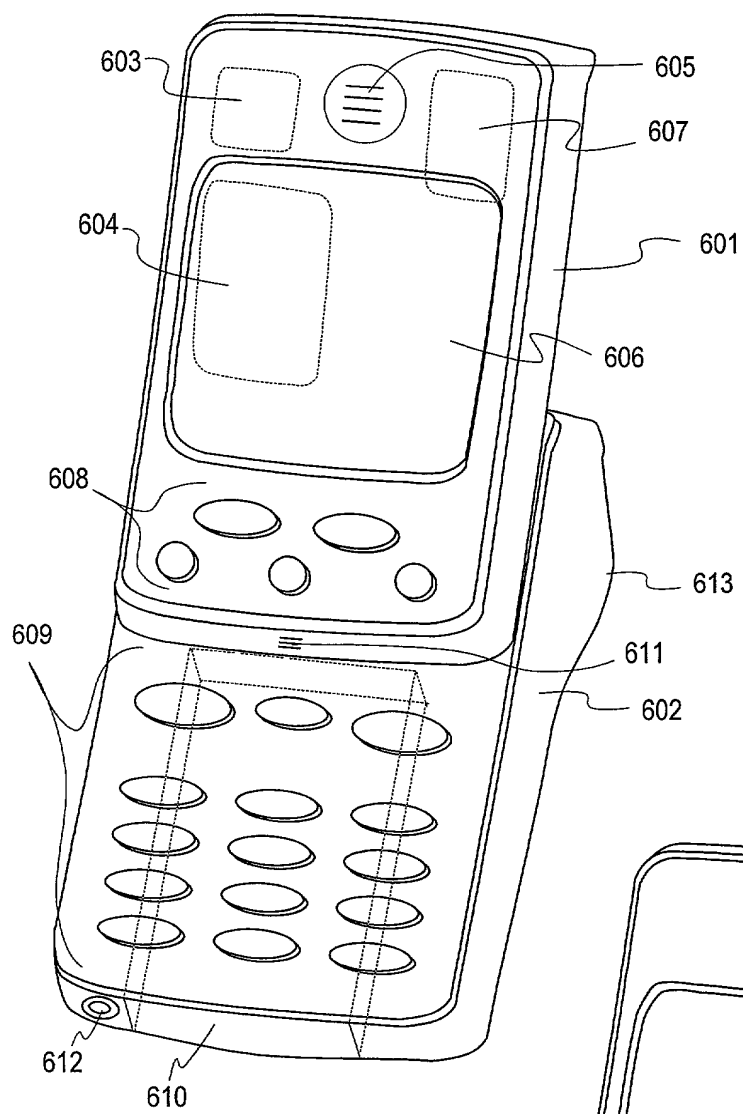


Fig. 6a

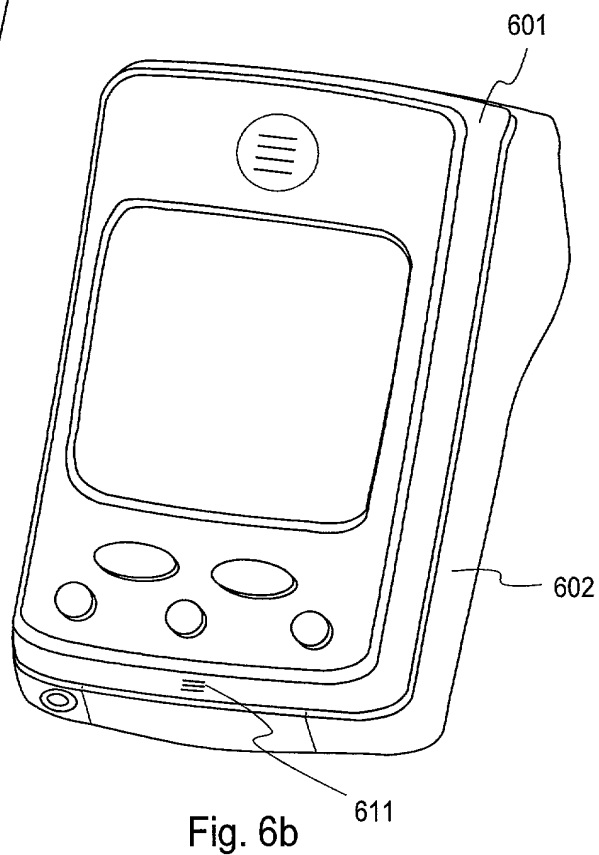
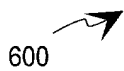
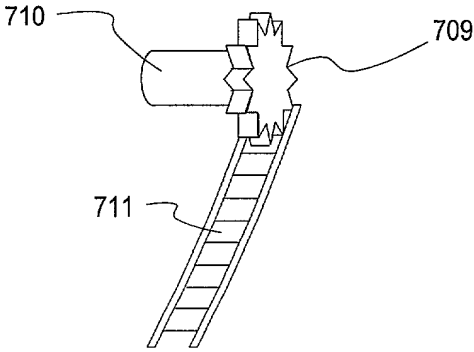
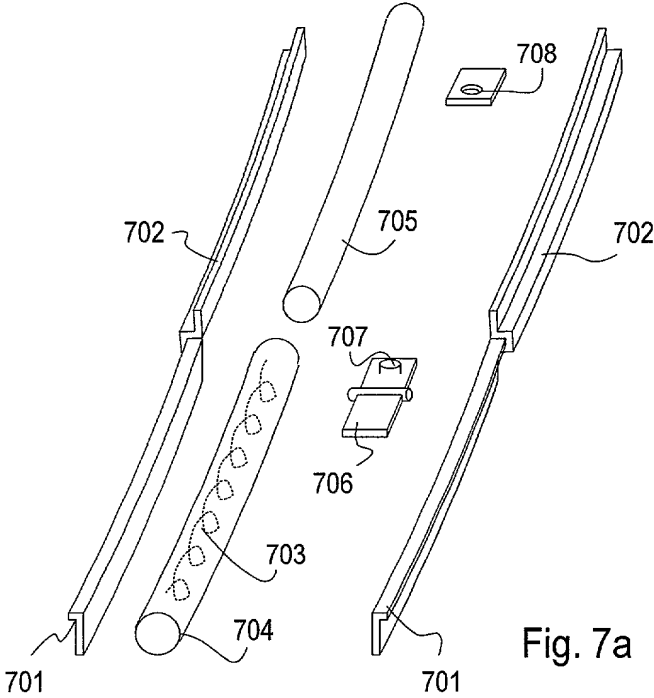


Fig. 6b





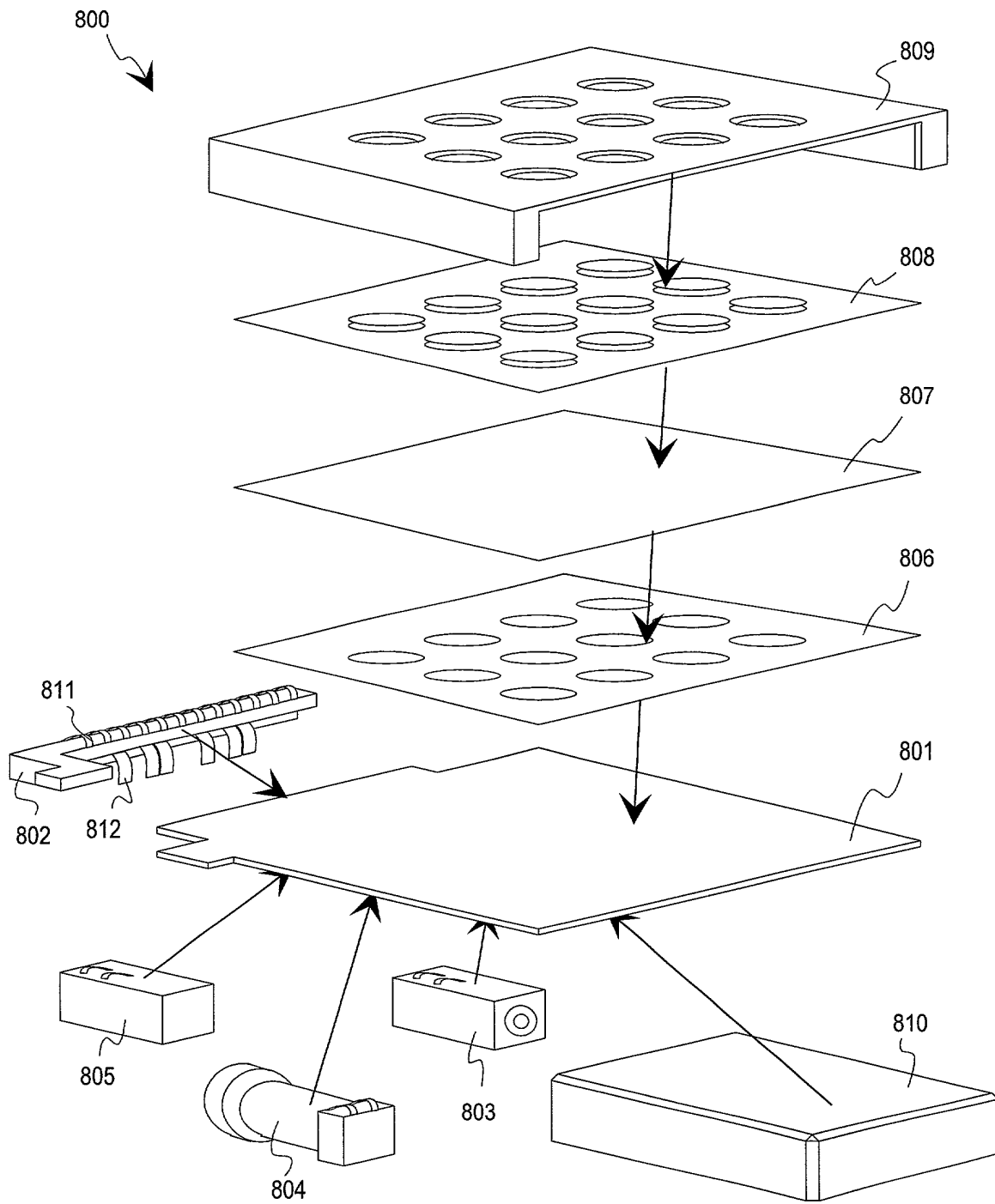


Fig. 8

Attorney's Docket No. _____

PATENT

**COMBINED DECLARATION AND POWER OF ATTORNEY
(ORIGINAL, DESIGN, NATIONAL STAGE OF PCT, SUPPLEMENTAL, DIVISIONAL,
CONTINUATION OR C-I-P)**

As a below named inventor, I hereby declare that:

TYPE OF DECLARATION

This declaration is of the following type:

(check one applicable item below)

- ☒ original.
☐ design.
☐ supplemental.

NOTE. If the declaration is for an International Application being filed as a divisional, continuation or continuation-in-part application, do not check next item; check appropriate one of last three items.

☐ national stage of PCT.

NOTE: If one of the following 3 items apply, then complete and also attach ADDED PAGES FOR DIVISIONAL, CONTINUATION OR C-I-P.

- ☐ divisional.
☐ continuation.
☐ continuation-in-part (C-I-P).

INVENTORSHIP IDENTIFICATION

WARNING: If the inventors are each not the inventors of all the claims, an explanation of the facts, including the ownership of all the claims at the time the last claimed invention was made, should be submitted.

My residence, post office address and citizenship are as stated below, next to my name. I believe that I am the original, first and sole inventor *(if only one name is listed below)* or an original, first and joint inventor *(if plural names are listed below)* of the subject matter that is claimed, and for which a patent is sought on the invention entitled:

TITLE OF INVENTION

Telescopic telephone

SPECIFICATION IDENTIFICATION

the specification of which:

(complete (a), (b) or (c))

(a) X is attached hereto.

(b) ___ was filed on _____, as ___ Serial No. 0 / _____
or ___ Express Mail No., as Serial No. not yet known _____
and was amended on _____ *(if applicable)*.

NOTE. Amendments filed after the original papers are deposited with the PTO that contain new matter are not accorded a filing date by being referred to in the declaration. Accordingly, the amendments involved are those filed with the application papers or, in the case of a supplemental declaration, are those amendments claiming matter not encompassed in the original statement of invention or claims. See 37 CFR 1.67.

(c) ___ was described and claimed in PCT International Application No. _____,
filed on _____ and as amended under PCT Article 19 on
_____ *(if any)*.

ACKNOWLEDGEMENT OF REVIEW OF PAPERS AND DUTY OF CANDOR

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information, which is material to patentability as defined in 37, Code of Federal Regulations, § 1.56,

(also check the following items, if desired)

X and which is material to the examination of this application, namely, information where there is a substantial likelihood that a reasonable Examiner would consider it important in deciding whether to allow the application to issue as a patent, and

___ in compliance with this duty, there is attached an information disclosure statement, in accordance with 37 CFR 1.98.

PRIORITY CLAIM (35 U.S.C. § 119(a)-(d))

I hereby claim foreign priority benefits under Title 35, United States Code, § 119(a)-(d) of any foreign application(s) for patent or inventor's certificate or of any PCT international application(s) designating at least one country other than the United States of America listed below and have also identified below any foreign application(s) for patent or inventor's certificate or any PCT international application(s) designating at least one country other than the United States of America filed by me on the same subject matter having a filing date before that of the application(s) of which priority is claimed.

(complete (d) or (e))

(d) no such applications have been filed.

(e) x such applications have been filed as follows.

NOTE. Where item (c) is entered above and the International Application which designated the U.S. itself claimed priority check item (e), enter the details below and make the priority claim.

**PRIOR FOREIGN/PCT APPLICATION(S) FILED WITHIN 12 MONTHS
(6 MONTHS FOR DESIGN) PRIOR TO THIS APPLICATION
AND ANY PRIORITY CLAIMS UNDER 35 U.S.C. § 119(a)-(d)**

COUNTRY(OR INDICATE IF PCT)	APPLICATION NUMBER	DATE OF FILING (day, month, year)	PRIORITY CLAIMED UNDER 37 USC 119	
Finland	980602	18 March 1998	<u> x </u> YES	NO
			YES	NO
			YES	NO
			YES	NO
			YES	NO

**CLAIM FOR BENEFIT OF PRIOR U.S. PROVISIONAL APPLICATION(S)
(34 U.S.C. § 119(e))**

I hereby claim the benefit under Title 35, United States Code, § 119(e) of any United States provisional application(s) listed below:

PROVISIONAL APPLICATION NUMBER

FILING DATE

**CLAIM FOR BENEFIT OF EARLIER US/PCT APPLICATION(S)
UNDER 35 U.S.C. 120**

— The claim for the benefit of any such applications are set forth in the attached
**ADDED PAGES TO COMBINED DECLARATION AND POWER OF
ATTORNEY FOR DIVISIONAL, CONTINUATION OR CONTINUATION-IN-
PART (C-I-P) APPLICATION.**

**ALL FOREIGN APPLICATION(S), IF ANY, FILED MORE THAN 12 MONTHS
(6 MONTHS FOR DESIGN) PRIOR TO THIS U.S. APPLICATION**

NOTE. If the application filed more than 12 months from the filing date of this application is a PCT filing forming the basis for this application entering the United States as (1) the national stage, or (2) a continuation, divisional, or continuation-in-part, then also complete ADDED PAGES TO COMBINED DECLARATION AND POWER OF ATTORNEY FOR DIVISIONAL, CONTINUATION OR C-I-P APPLICATION for benefit of the prior U.S. or PCT application(s) under 35 U.S.C. § 120.

POWER OF ATTORNEY

I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

(list name and registration number)

Clarence A. Green	(24,622)
Harry F. Smith	(32,493)
Mark F. Harrington	(31,686)

(check the following item, if applicable)

— Attached, as part of this declaration and power of attorney, is the authorization of the above-named attorney(s) to accept and follow instructions from my representative(s).

SEND CORRESPONDENCE TO

Clarence A. Green
Perman & Green
425 Post Road
Fairfield, Ct 06430

DIRECT TELEPHONE CALLS TO:

(Name and telephone number)

Clarence A. Green
203-259-1800

DECLARATION

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that wilful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such wilful false statements may jeopardize the validity of the application or any patent issued thereon.

SIGNATURE(S)

NOTE: Carefully indicate the family (or last) name, as it should appear on the filing receipt and all other documents.

Full name of sole or first inventor:

Given name: Pekka

Middle initial or name:

Family (or last name): LONKA

Inventor's signature: 

Date: 27. Jan 1999

Country of Citizenship: Finland

Residence: Paasionkatu 5, FIN-24100 Salo, Finland

Post Office Address: Paasionkatu 5, FIN-24100 Salo, Finland

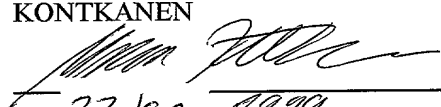
PK 27 Jan 99

Full name of second joint inventor, if any:

Given name: Mikael

Middle initial or name:

Family (or last name): KONTKANEN

Inventor's signature: 

Date: 27 Jan. 1999

Country of Citizenship: Finland

Residence: Sannankatu 3 B, FIN-24100 Salo, Finland

Post Office Address: Sannankatu 3 B, FIN-24100 Salo, Finland

UM 27 Jan 1999

Full name of third joint inventor, if any:

Given name:

Middle initial or name:

Family (or last name):

Inventor's signature: _____

Date: _____

Country of Citizenship: _____

Residence: _____

Post Office Address: _____

(check proper box(es) for any of the following added page(s)
that form a part of this declaration)

☐ **Signature** fourth and subsequent joint inventors. *Number of pages added*

* * *

☐ **Signature** by administrator(trix), executor(trix) or legal representative for deceased or incapacitated inventor. *Number of pages added* _____.

* * *

☐ **Signature** for inventor who refuses to sign or cannot be reached by person authorized under 37 CFR 1.47. *Number of pages added* _____.

* * *

☐ Added page for **signature** by one joint inventor on behalf of deceased inventor(s) where legal representative cannot be appointed in time. (37 CFR 1.47)

* * *

☐ Added pages to combined declaration and power of attorney for divisional, continuation, or continuation-in-part (C-I-P) application.
_____ *Number of pages added* _____

* * *

☐ Authorization of attorney(s) to accept and follow instructions from representative.

* * *

(if no further pages form a part of this Declaration,
then end this Declaration with this page and check the following item)

☒ This declaration ends with this page.